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New Assistant Commissioner for Higher Education*

LLOYD E. BLAUCH, for years a member of the professional staff of the Office of Education, has been appointed Assistant Commissioner for Higher Education in the Office of Education, Department of Health, Education, and Welfare. In this capacity he serves as Director of the Division of Higher Education.

Education and Professional Experience

Dr. Blauch was born at Meyersdale, Pa., in 1889. He received the bachelor's degree from Goshen College in 1916, the master of arts degree from the University of Chicago in 1917, and the doctor of philosophy degree from the same university in 1923.

He began his educational career by serving as teacher, principal, and superintendent of public schools in Pennsylvania and Ohio. His college and university experience included 7 years at the North Carolina College for Women (now Woman's College of the University of North Carolina), and 20 summers at the University of Maryland. He has also taught in the summer sessions of Joliet Junior College, Loyola University in Chicago, and the University of Chicago. For 2½ years he was principal educational specialist for the President's Advisory Committee on Education and was responsible for 5 published staff studies.

His higher education survey experience includes service with the Survey of Methodist Colleges, 1930–31. For 4 years, 1931–35, he was Executive Secretary of the Curriculum Survey Committee, American Association of Dental Schools, for which he prepared the report titled *A Course of Study in Dentistry* and a book titled *Teaching in Colleges and Universities*, both published by the association. From 1947 to 1950 he served on a part-time basis as assistant director in charge of curriculum studies for the Pharmaceutical Survey, American Council on Education, and with George L. Webster wrote *The Pharmaceutical Curriculum*. He participated in 7 other higher education surveys, including the National Survey of the Higher Education of Negroes.

Service in the Office of Education

Since he joined the Office of Education staff, Dr. Blauch has been successively, over a period of 36 years, educational statistician, specialist in charge of land-grant college statistics, consultant on inter-American educational relations, specialist in higher education, specialist for land-grant colleges and universities, and chief for education in

* Contributed by John H. Lloyd, Chief, Reports Section, Publications Services, Office of Education.

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the health professions. Recently he has been Acting Assistant Commissioner for Higher Education.

Publications

The newly appointed Assistant Commissioner for Higher Education has had responsibility for the editorial direction of the Office of Education periodical *Higher Education* since its beginning. He is the author or co-author of a number of educational publications which, in addition to the three named above, include *Federal Cooperation in Agricultural Extension Work*, *Vocational Education*, *and Vocational Rehabilitation*, and *Federal Activities in Education*. His latest publication is *Education for the Professions* recently issued by the Office of Education.

Honors

Honorary membership has been granted Dr. Blauch by Rho Chi, honor society in Pharmacy; Omicron Kappa Upsilon, honor society in Dentistry; American College of Dentists; and the American Association of Dental Examiners. He also holds membership in the National Education Association. He received the superior service award of the Department of Health, Education, and Welfare in 1955 for outstanding service to American education through distinguished research and consultation in higher education and for unique service to education for the health professions.

Family

Mrs. Blauch, formerly Mary Brannock, received the Ph. D. degree in the field of biochemistry from the University of Chicago in 1939. She was a member of the faculty of the North Carolina College for Women. The family includes one son, James.

International Relations Fellowships

A FELLOWSHIP PROGRAM for special advanced training related to international and foreign affairs has been announced by the Ford Foundation. The program has two major purposes. One is to help persons who are teaching or doing research in international relations to broaden their competence in related fields; the other is to encourage a larger and needed contribution from the social sciences and related fields to the understanding of international and foreign affairs.

Persons now studying or teaching international relations will be assisted in undertaking graduate training in another social science or in the history, culture, and current problems of one or more nations of Asia, the Near East, Africa, or the Soviet and East European area. Persons who are already trained in one of the other social sciences or related humanities, or who have specialized foreign area training, will be assisted in undertaking graduate work in international relations.

The program will provide fellowships for a few American men and women of unusual promise to take up to 2 years of training, beginning no later than January 1, 1957. Application is open to persons who hold the doctor of philosophy degree or who expect at least to have completed all requirements for the degree, except the dissertation, by February 1956. The final date for filing applications is December 15, 1955. Application forms and further information may be obtained from: The Secretary, the Ford Foundation, Attention: International Relations Training Fellowships, 477 Madison Avenue, New York 22, N. Y.

Yeshiva's College for Women

YESHIVA UNIVERSITY'S Stern College for Women, which opened last September as the Nation's first liberal arts college for women under Jewish auspices, beginning this fall is offering a 4-year course of study leading to the bachelor of arts and bachelor of religious education degrees. Students can major in the natural sciences, humanities, social sciences, or Hebraic studies. Courses in Jewish studies are offered on the elementary, intermediate, and advanced levels.

Origins of Faculties

THE ASSOCIATION of AMERICAN COLLEGES with a grant from the Fund for the Advancement of Education is studying the baccalaureate origins of the faculties of liberal arts colleges, teachers colleges, and junior colleges. The study is a project of the association's Commission on Teacher Education and is being directed by Frank R. Kille, dean of Carleton College, Northfield, Minn. The association expects it to be completed by next summer.

American Doctoral Dissertations on Foreign Education

By WALTER CROSBY EELLS*

MORE THAN a thousand doctoral dissertations [1] with education or educators in foreign countries as their principal subject have been accepted in institutions of higher education in the United States in the past 70 years. All except 13 of them have been produced in the present century. They have been accepted by 69 different institutions. They are concerned in whole or in part with education in 91 foreign countries, colonies, or other political units.

The largest number of these dissertations, almost two-fifths of the total number, deal with education in the countries of Asia. One-third of them are concerned with some phase of European education. Less than two percent of them deal entirely with South American countries.

The number of doctoral dissertations in American institutions of higher education concerned with foreign education, grouped by continents, is shown below:

Continent	*Number of dissertations*
General	52
Africa	54
Asia	391
Australasia	13
Europe	353
North America	177
South America	19
	1,059

Institutions Represented

Although the dissertations have been written at a total of 69 different American institutions of higher education, only 22 of the institutions have conferred 10 or more doctorates for dissertations in the field of foreign education. These 22 institutions are responsible for more than six-sevenths of the total number of such dissertations. Two institutions, Columbia University and New York University, are credited with almost half of the total number.

The number of doctorates on foreign education conferred by the American universities that have accepted 10 or more such dissertations follows:

University	*Number of doctorates*
Columbia University	349
New York University	144
University of Chicago	48
Harvard University	44
Catholic University of America	36
Stanford University	32
Ohio State University	29
Yale University	25
Cornell University	24
University of California	20
University of Southern California	18
Indiana University	17
University of Michigan	17
University of Washington	15
State University of Iowa	14
Fordham University	13
Johns Hopkins University	12
University of Wisconsin	12
George Peabody College for Teachers	10
Northwestern University	10
University of Minnesota	10
University of Pennsylvania	10

Ten other institutions had from 5 to 9 dissertations each, 13 had 3 or 4 each, 13 had 2 each, and 11 had only 1 each.

*Formerly chief, Higher Education Branch, Education Division, Civil Information and Education Section, General Headquarters, Supreme Commander for the Allied Powers, Tokyo, Japan. Dr. Eells is retired.

[1] Many sources have been consulted in compiling the lists upon which the summaries of this article are based. Titles of all dissertations in education and related fields have been examined in *Doctoral Dissertations Accepted by American Universities* (New York: H. W. Wilson Co., 1934–54, 21 vols.); *Bibliography of Research Studies in Education* (Washington: U. S. Office of Education, 1929–41, 13 vols., and continued in manuscript to 1952); W. S. Monroe's *Titles of Masters' and Doctors' Theses in Education Accepted by American Colleges and Universities* (Urbana: University of Illinois 1920–28, 6 vols.); *American Doctoral Dissertations Printed* (Washington: Library of Congress, 1912–38, 27 vols.); Ruth Gray's *Doctors' Theses in Education* (Washington: U. S. Office of Education, Pamphlet No. 60, 1935. Lists 797 dissertations deposited in the library of the Office prior to September 1934); T. R. Palfrey's *Guide to Bibliography of Theses* (Chicago: American Library Association, 1936); Mary L. Lyda and Stanley B. Brown's *Research Studies in Education: A Subject Index, 1941–51* (Boulder: University of Colorado, 1953); *Theses on Pan-American Topics* (Washington: Pan-American Union, 1941); *Theses and Dissertations by Chinese Students in America* (New York: China Institute of America, 1927, 1928, 1934—3 vols. covering 1902 to 1931); *Doctoral Dissertations on Japan Accepted by American Universities, 1912–39* (New York: Japan Institute, Inc., 1940); several other specialized bibliographies and numerous lists of dissertations issued by individual universities especially for the earlier years not systematically covered by the general sources mentioned above. Titles as given were frequently supplemented by references to published abstracts in *Dissertation Abstracts* and in the various abstract series published by individual institutions, and by consultation of the extensive file of doctoral dissertations of many universities in the library of the U. S. Office of Education before deciding to include some of the titles or under which country or countries to classify them when the information given by the title itself was insufficient. No claim for absolute completeness is made. Undoubtedly a few dissertations have been overlooked in spite of the effort that has been made to locate as many of them as possible.

Early Dissertations on Foreign Education

The first doctoral dissertation found dealing with foreign education or a foreign educator was accepted by Johns Hopkins University in 1884. It was written by John Dewey on "The Psychology of Kant." Two others were accepted at Johns Hopkins in 1895, "Christian Missions in China," by Charles S. Estes, and "Christianity in Japan, 1859–83," by Masanobu Ishizaka. Both of these dissertations dealt in part with Christian schools in China and Japan.

The second dissertation, in point of time, was at New York University in 1891, written by William J. Eckoff, "Educational Views of Goethe." New York University accepted three others in 1893: "Christianity and the Pagan Schools of the First Three Centuries," by Theodorus B. Hascall; "Augustine's Psychology," by Robert H. McReady; and "Gautama Buddha and Jesus Christ as Moral Teachers," by Lindsay Parker; two others in 1894, "Education in Great Britain and Ireland," by Ernst Richard, and "Education in Italy," by Augustin Knoflach; and one in 1895, on "Montaigne," by Lizzie E. Rector—the first one by a woman.

The third dissertation was accepted by Yale University in 1893. In it Jeremiah K. Light studied "Kant's Influence on German Pedagogy."

The earliest dissertation on foreign education accepted at Columbia University was one in 1896 by Frederic L. Luqueer, who wrote on "Hegel as an Educator." Three years later, William I. Chamberlain had a dissertation on "Education in India."

No American institution other than these four appears to have had a doctoral dissertation on foreign education before 1900.

Chronological Classification

A classification by 5-year periods and by single years since 1949 is given below. It should be pointed out, however, that different sources do not always agree on dates. Sometimes the date of publication rather than date of acceptance of a dissertation is found and other discrepancies harder to explain occur. Where it was possible to find it, date of acceptance was preferred. The writer used his best judgment in assigning dates when conflicts were found, but they cannot always be guaranteed within a year or two. *Doctoral Dissertations Accepted by American Universities* (the Wilson lists) frequently gives titles one or more years late without indication of the date of acceptance.

A chronological classification of doctoral dissertations on foreign education accepted by American universities from 1884 to 1954 shows the following distribution:

Period	*Number of dissertations*	*Period*	*Number of dissertations*
1880–84	1	1935–39	150
1885–89	0	1940–44	124
1890–94	7	1945–49	158
1895–99	5	1950	63
1900–04	4	1951	49
1905–09	17	1952	50
1910–14	34	1953	68
1915–19	25	1954	73
1920–24	45		
1925–29	71		1,059
1930–34	115		

The number of doctorates on foreign education accepted during the last 5 years is almost equal to the total number accepted in the 50 years since the first one in 1884. This reflects not only the great increase in foreign students studying in the United States, many of whom select subjects for their doctoral dissertations related to the improvement of education in their home countries, but also the greatly increased interest in foreign education of American candidates for the doctorate in education.

Classification by Countries

Most significant, however, is a classification of the dissertations by countries, more detailed than the brief summary previously given. This classification is shown in table 1. A word of explanation should be made concerning the classification "General" at the beginning of the table and under the different continents. The first such heading includes two types of dissertations: (1) Those of a general nature involving foreign education such as "The World Literacy Movement" (J. B. Adair, University of Texas, 1951), or "On the Education of Backward Races" (E. W. Coffin, Clark University, 1908); and (2) those referring to education in specific countries not on the same continent, such as "A Comparative Study of Teacher Education in France, England, America, and China" (T. C. Teng, University of Colorado, 1950). Dr. Teng's dissertation and others like it have been listed in the "Partial" column in table 1 under each of the countries—China, France, and Great Britain. Similarly dissertations which deal with two or more European countries have been listed primarily under the "General" head in Europe, and then in the "Partial" column for each country concerned; and similarly for other continents.

Table 1.—Doctoral dissertations in American institutions of higher education concerning foreign education by countries

Country	Primary	Partial	Total
General	52	0	52
Africa			
General	2	4	6
Angola	2	0	2
Belgian Congo	2	1	3
Egypt	25	1	26
Eritrea	0	1	1
Ethiopia	0	1	1
Gold Coast	1	0	1
Liberia	1	2	3
Libya	0	1	1
Nigeria	4	1	5
Nyasaland	1	0	1
Sierra Leone	2	1	3
Somaliland	0	1	1
South Africa	14	4	18
	54	18	72
Asia[1]			
General	9	3	12
Afghanistan	2	2	4
Burma	4	0	4
Ceylon	1	1	2
China	131	10	141
Hong Kong	1	0	1
India	79	4	83
Iran	12	1	13
Iraq	12	1	13
Israel	20	11	31
Japan	33	10	43
Korea	11	3	14
Lebanon	1	1	2
Malaya	3	0	3
Pakistan	6	1	7
Philippines	45	4	49
Syria	4	0	4
Thailand	11	1	12
Turkey	5	4	9
	390	57	447
Australasia			
Australia	12	1	13
Fiji	1	0	1
Guam	0	2	2
Indonesia	0	1	1
New Zealand	0	2	2
Samoa	0	2	2
	13	8	21
Europe			
General	44	0	44
Albania	0	1	1
Austria	4	5	9
Belgium	6	4	10
Bulgaria	0	1	1
Cyprus	1	0	1
Czechoslovakia	1	5	6
Denmark	5	6	11
Estonia	0	1	1
Finland	1	1	2
France	40	20	60
Germany	77	23	100
Great Britain	75	25	100
Greece	13	7	20
Hungary	3	1	4
Iceland	0	1	1
Ireland	2	3	5
Italy	33	11	44
Latvia	0	1	1
Lithuania	0	1	1
Malta	0	1	1
Netherlands	7	3	10
Norway	4	5	9
Poland	5	3	8
Portugal	1	2	3
Rumania	0	1	1
Russia	12	7	19
Spain	5	3	8
Sweden	9	3	12
Switzerland	5	8	13
Yugoslavia	0	1	1
	353	154	507
North America			
General	3	4	7
British West Indies	3	1	4
Canada—General	34	2	36
Alberta	13	2	15
British Columbia	10	3	13
Manitoba	3	1	4
New Brunswick	4	4	8
Newfoundland	3	1	4
Nova Scotia	9	4	13
Ontario	16	3	19
Prince Edward Island	1	3	4
Quebec	9	6	15
Saskatchewan	6	2	8
Costa Rica	1	3	4
Cuba	1	2	3
Dominican Republic	0	1	1
El Salvador	2	2	4
Guatemala	2	3	5
Haiti	1	2	3
Honduras	0	2	2

[1] See W. C. Eells, *American Doctoral Dissertations on Education in Countries of the Middle East* (Washington, Middle East Institute, September 1955. 28 p.), for a list of 184 dissertations on education in 16 Middle Eastern countries.

Table 1.—Doctoral dissertations—Continued

Country	Primary	Partial	Total
North America—Continued			
Mexico	30	2	32
Nicaragua	0	2	2
Panama	1	1	2
Puerto Rico	25	2	27
Virgin Islands	0	2	2
	177	60	237
South America			
General	3	4	7
Argentina	4	5	9
Bolivia	1	2	3
Brazil	0	2	2
Chile	3	4	7
Colombia	2	2	4
Ecuador	1	3	4
Paraguay	1	3	4
Peru	3	1	4
Uruguay	1	4	5
Venezuela	0	1	1
	19	31	50

There were more than 50 dissertations involving two or more countries each (or provinces in the case of Canada) which account for the 333 shown in the "Partial" column. The total number of separate dissertations is shown in the "Primary" column. But to find the total number of dissertations dealing entirely or substantially with education in a particular country the third or "Total" column should be used. Thus there are 141 dissertations dealing with Chinese education, 131 in full and 10 in combination with other countries, such as Dr. Teng's dissertation mentioned above.

The largest number of the dissertations summarized in table 1 have been written on education in China (141). Our next-door northern neighbor Canada is second with 113. These two are followed in order by Germany and Great Britain, each with 100, India with 88, and France with 60. These 6 countries are the only ones which have more than 50 dissertations each. Seven other countries—Philippines, Italy, Japan, Mexico, Israel, Puerto Rico, and Egypt—have between 25 and 50 each.

Puerto Rico has been included in this "foreign" classification because formerly it was not under the jurisdiction of the United States and because its educational problems are more closely related to Latin-American countries than to those of the United States. Similar reasoning accounts for the inclusion of Guam, Samoa, and the Virgin Islands.

The most surprising feature is the small number of dissertations dealing with education in the countries of South America, as already mentioned. The total number of different dissertations entirely on education in South American countries is only 19 (less than 2 percent), although according to the Institute of International Education's data for 1954–55 more than 11 percent of the 34,234 foreign students in the United States were from South America.

Authorship

It is impossible to tell from the data available the proportion of dissertations which are the products of foreign students and of American students. In the case of Asia and Africa, however, the nationality of the authors can be estimated with considerable reliability from their non-English type names. By this method it appears that almost two-thirds of the dissertations dealing with Asian and African education are the work of authors who are natives of countries in those two continents. Undoubtedly a much smaller proportion of dissertations dealing with European and American countries is the work of nationals of those countries.

About 200 of the dissertations, almost one-fifth of the total number, are the work of women. This may be compared with the fact that in the United States in the past 30 years only 11 percent of the doctoral dissertations have been written by women.

Western Interstate Compact

Two NEW MEMBERS—California and Alaska—have joined the Western Interstate Compact for Higher Education. The other States which had previously joined are Arizona, Colorado, Idaho, Montana, New Mexico, Oregon, Utah, Washington, and Wyoming. Of the areas eligible to join the compact only Nevada and Hawaii are not in it. California's entrance into the compact adds significantly to the available medical, dental, and veterinary medical schools to which contract students may be sent.

The Western Interstate Commission for Higher Education, which administers the compact, maintains offices in Johnson Hall, University of Oregon, Eugene, Oreg. It publishes *Higher Education in the West*, a periodical now in its second year.

Accreditation of Engineering Curricula

BY HENRY H. ARMSBY*

THE FIRST SCHOOL of technology in any English speaking country was the United States Military Academy at West Point, established in 1802. By 1852, when the first professional engineering society in the United States (the American Society of Civil Engineers) was established, 8 or 10 civilian engineering schools had been established in the Nation. The "land-grant" colleges instituted under the first Morrill Act of 1862 included schools of engineering, and their establishment gave emphasis to the development of similar schools in private institutions and in non-land-grant State universities. The number of engineering schools in operation had increased to more than 100 in 1893 when the Society for the Promotion of Engineering Education (SPEE, since 1945 the American Society for Engineering Education—ASEE) was organized as Section E of the World's Engineering Congress at the Columbian Exposition. The number of engineering schools has continued to increase, to 147 in 1940; to 218 in 1954.

Need for Accreditation

By the early 1930's the growth in the number of engineers and of engineering societies, and the increasing proportion of college graduates among them, led to a recognition of the need for setting up criteria for qualification for membership in the societies and for a better coordination of their activities directed toward the professional advancement of engineers.

During these years licensing laws for engineers were being adopted by many States. Each State board of registration needed a list of schools whose engineering curricula were judged adequate to provide educational preparation for prospective registrants. It became apparent to the National Council of State Boards of Engineering Examiners (NCSBEE) that a national list, and not 48 separate State lists, was essential to avoid serious complications and to provide a reasonable degree of uniformity in the accrediting procedures being set up in the States.

Engineering degrees were being granted in 1932 by over 135 colleges and universities. Among these institutions marked differences existed in educational standards, strength and breadth of curricula, qualifications of faculty, and adequacy of facilities. There was an obvious need for the establishment of criteria for judging these and other elements of engineering education programs, to constitute a just and reasonable basis for identifying those programs whose graduates were worthy of recognition by engineering societies and by the State boards of registration.

Creation of Engineers' Council for Professional Development

To meet these needs the national engineering societies representing the fields of chemical, civil, electrical, mechanical, metallurgical and mining engineering, together with SPEE and NCSBEE, joined in the creation of the Engineers' Council for Professional Development (ECPD). The original council was composed of 21 members, 3 from each of the participating bodies. In 1940 the Engineering Institute of Canada became the eighth constituent body. Since then ECPD has had 24 members, from whom a chairman is elected, plus a secretary, who need not be one of the representatives.

The general objective of ECPD was stated in its first annual report, issued in October 1933, to be "the enhancement of the professional status of the engineer. To this end it aims to coordinate and promote efforts and aspirations directed toward the higher professional standards of education and practice, greater solidarity of the profession, and greater effectiveness in dealing with technical, social, and economic problems."

Accreditation of Engineering Curricula

The first annual meeting of ECPD in 1933 was devoted to hearing reports and recommendations of the four standing committees, namely student selec-

*Chief for engineering education, U. S. Department of Health, Education, and Welfare, Office of Education. In preparing this article the writer has drawn heavily on the sources listed as Selected References, especially the two articles by Dr. Hazen, who has reviewed the manuscript. At the time he wrote these articles Dr. Hazen, dean of the Graduate School of Massachusetts Institute of Technology, was the chairman of Region II, Education Committee of the Engineers' Council for Professional Development. He is now general chairman of the national Education Committee of the council.

tion and guidance, engineering schools, professional training, and professional recognition. The committee on engineering schools, after a study of the procedures then in effect in other fields and of the lists of accredited engineering schools which had been set up by several of the State registration boards, reached the conclusion that there was no thoroughly representative and authoritative accrediting agency in the field of engineering. The committee believed that one of the proper functions of ECPD should be "to compose a list of institutions which, after careful investigation, are found to be adequately prepared to offer sound and comprehensive instruction in the various major curricula."

The committee in its statement of policy said:

> * * * some method of accrediting engineering schools is required by force of laws governing the licensing of engineers in a majority of States. In order that accrediting may be done uniformly, consistent with the high ideals of the engineering profession and in such a manner as to be a stimulus to the best development of engineering education, rather than a deterrent to future progress through codification of certain present standards, the National Engineering Societies should be invited to prepare and administer a plan of accrediting engineering schools. The following principles are suggested as a basis of such plan:
>
> Absolute minimum standards for the education process have been avoided as likely to fetter future progress. Information on important aspects of organization, administration, curricula, and standards of each school is to be assembled, the institution personally investigated by a committee and final action taken by the ECPD after careful consideration of all aspects of the situation.
>
> Because of the variety of types of engineering training and specialized character of many schools, accrediting is done on the basis of six major curricula rather than for the school as a whole. Allowance is made, however, for consideration of other curricula than these six.
>
> It is hoped that the accredited list to be prepared on these bases may be uniformly adopted, thus relieving societies and States from the necessity of duplicating individual action, and relieving schools from the necessity of submitting to numerous examinations and questionnaires.

The Committee on Engineering Schools, composed of distinguished engineering educators under the chairmanship of Karl T. Compton, president of the Massachusetts Institute of Technology, spent 4 years in making its initial studies, and published the first general list of accredited curricula in 1937. Of 626 curricula inspected in 129 institutions visited, 374 were accredited for a limited time, and 71 accredited provisionally, in 107 institutions. Action was deferred on 8, and 173 were not accredited.

This committee, now known as the Education Committee,[1] has continued its activities through the years, and as of October 1954 ECPD listed as fully or provisionally accredited 716 curricula and 76 options in 150 institutions out of the 218 institutions granting degrees in engineering.

[1] At its annual meeting in October 1955 ECPD will consider a proposal to change the name of this committee to the Committee on Accrediting.

Basic Policies of ECPD

The principles of operation formulated by the original committee and approved by ECPD have proved sufficiently sound to require relatively little change over the years. The 22d annual report of ECPD, issued in September 1954, outlines the current basic policies which the committee has evolved during the years:

1. The accrediting of curricula rather than institutions, for it is well recognized that curricula of quite different standards may sometimes be found at the same institution.
2. The consideration for accrediting of only those curricula leading to first degrees in engineering at an institution—generally undergraduate curricula. Accreditation of graduate programs is not included at the present time pending further stabilization of the objectives and operation of graduate engineering education among the institutions and the profession. The Education Committee maintains a Subcommittee on Graduate Education for continuing study of this matter.
3. The invitation to institutions to submit curricula without persuasion or pressure brought to bear by the committee.
4. The avoidance of rigid standards as a basis for accrediting, in order to prevent standardization and ossification of engineering education and to encourage well-planned experimentation.
5. As a safeguard to the public and without setting any rigid standards, the nonaccrediting of curricula which omit a significant portion of a subject in which the public may reasonably expect engineers of that field to have competence.
6. The careful consideration of qualitative as well as quantitative factors through a visit of inspection by a competent committee of engineers and engineering educators.
7. The review of the findings and recommendations of the inspection committee by the appropriate regional chairman, by the Education Committee, and finally by ECPD.
8. The publication of a list of accredited curricula only, with no information available to any person (other than proper officials of an institution concerned) as to whether any curriculum or institution not on the accredited list had been under consideration by ECPD.

The Committee on Engineering Schools originally intended to accredit on the basis of the curricula (chemical, civil, electrical, mechanical, metallurgical, and mining engineering) rather than for the school as a whole. However, the committee's published criteria made provision, as do those published in the 1954 annual report, for "such other curricula as are warranted by the educational and industrial conditions pertaining to them." This left the door wide open, and in the first list of accredited curricula published by the council 14 curricula were recog-

nized. Since then the ECPD committees have continued to resist the proliferation of curricula, but it has been a losing battle. The 1954 annual report lists 20 different curricula, and a number of others have been proposed from time to time.

Criteria for Accrediting Engineering Curricula

The following statement, published in the 22d annual report of ECPD (1954) as having been approved by the council and by the constituent organizations, embodies the principles in accordance with which accrediting is conducted.

I. Purpose of accrediting shall be to identify those institutions which offer professional curricula in engineering worthy of recognition as such.

II. Accrediting shall apply only to those curricula which lead to degrees.

III. Both undergraduate and graduate curricula shall be accredited. (Accrediting program at present embraces undergraduate curricula only.)

IV. Curricula in each institution shall be accredited individually. For this purpose, ECPD will recognize the six major curricula—chemical, civil, electrical, mechanical, metallurgical, and mining engineering—represented in its own organization, and such other curricula as are warranted by the educational and professional conditions pertaining to them.

V. Curricula shall be accredited on the basis of both qualitative and quantitative criteria.

VI. Qualitative criteria shall be evaluated through visits of inspection by a committee or committees of qualified individuals representing ECPD.

VII. Quantitative criteria shall be evaluated through data secured from catalogs and other publications, from questionnaires, and by verification by the visiting committee.

VIII. Qualitative criteria shall include the following:

(1) The extent to which the curriculum develops the distinguishing characteristic of the engineer—ability to design, recognized in its broadest sense by the committee to be the "ability to apply creatively scientific principles to design or develop structures, machines, apparatus, or manufacturing processes, or works utilizing them singly or in combination; or to construct or operate the same with full cognizance of their design, and of the limitations of behavior imposed by such design; or to forecast their behavior under specific operating conditions; all as respects an intended function, economics of operation, and safety to life and property." This definition forms part of the committee's statement, "Differentiating Characteristics of an Engineering Curriculum."

(2) Qualifications, experience, intellectual interests, attainments, and professional productivity of members of the faculty.

(3) Standards and quality of instruction: (*a*) In the engineering departments; (*b*) in the scientific and other cooperating departments in which engineering students receive instruction.

(4) Progression of courses and the manner in which fundamental scientific training of the earlier years is carried into the teaching of the later engineering courses.

(5) Scholastic work of students.

(6) Records of graduates both in graduate study and in practice.

(7) Attitude and policy of administration toward its engineering division and toward teaching, research, and scholarly production.

IX. Quantitative criteria shall include the following:

(1) Auspices, control, and organization of the institution and of the engineering division.

(2) Curricula offered and degrees conferred.

(3) Age of the institution and of the individual curricula.

(4) Basis of and requirements for admission of students.

(5) Number of students enrolled: (*a*) In the engineering college or division as a whole; (*b*) in the individual curricula.

(6) Graduation requirements.

(7) Teaching staff and teaching loads.

(8) Physical facilities—the educational plant devoted to engineering education.

(9) Finances: investments, expenditures, sources of income.

Proposed Additional Criteria

On October 28, 1954, the ECPD Council approved recommendations of the Education Committee which included new criteria to be met by accredited engineering curricula in addition to those listed above. These new criteria established approximate fractions of the curriculum to be devoted to mathematics and basic sciences, engineering sciences, engineering analysis, design and engineering systems, and humanistic and social studies. The committee also recommended a distinction between "major engineering curricula" and "cognate engineering curricula," based chiefly upon the relative amounts of time devoted to the engineering sciences and the basic sciences.

These new criteria are under active discussion by ECPD as this article is written, and a modified proposal will be submitted to the council at its annual meeting in October 1955. The new proposal makes no mention of "cognate curricula" but sets forth approximate time distributions for the major fields listed above, with the provision that certain substitutions may be made for the subjects listed under "engineering sciences," to provide additional flexibility.

Both the statement of last year and the new proposal emphasize the desirability of well-considered experimentation in engineering curricula, and both point out that ECPD continues to favor the utilization of options in major curricula (such as sanitary option in civil engineering) in preference to especially designated curricula wherever practicable. Both state that a vocational or technical institute curriculum cannot qualify for accreditation.

These criteria, if adopted, will be considered as a

statement of principles to be applied with judgment in each case rather than with arbitrary rigidity. Their purpose is to insure an adequate foundation in science, engineering science, and the humanities, and an introduction to engineering methods, while providing sufficient flexibility in science to accommodate curricula requiring special programs such as life science or health science.

Accreditation Procedures

The list of accredited undergraduate curricula, as published in the ECPD report, results from actions taken by ECPD upon the recommendations of its Education Committee. This committee is charged with the responsibility for organizing inspections of individual institutions, considering the reports of inspection committees, and preparing recommendations for final action by ECPD. Membership on the Education Committee includes its general chairman, a secretary, a chairman and vice chairman for each of 7 regions into which the country is divided, such members at large as the council may appoint, and a representative of the Engineering Institute of Canada, a total of 18 persons at the present time.

Accreditation of a curriculum is granted for a limited period, usually from 3 to 5 years, with reappraisal stipulated at the end of the period. Early in each academic year each regional chairman and vice chairman prepare a list of institutions in their region whose existing terms of accreditation for one or more curricula terminate during the year, and check this list with the Education Committee chairman. ECPD examines curricula only upon invitation by an institution, but such an invitation is normally received promptly, either on the initiative of the institution or upon inquiry by the regional chairman. Upon receipt of this invitation the chairman of the Education Committee sends the appropriate bill and questionnaire forms to the institution. Subsequently the regional chairman selects an inspection committee from the list of constituent society members approved by the respective societies. Inspection committees may include persons from adjacent regions for reasons of availability, transportation, expense, or interregional comparisons, or in special cases other persons approved by the appropriate professional society.

Normally the regional chairman or vice chairman is expected to be a member of each visiting committee, and may be its chairman, although he may select another member as chairman to distribute the workload or to avoid undue influence of any one person in the preparation of recommendations to the Education Committee.

The chairman of the inspection committee arranges with the institution for a mutually convenient time to visit the institution, proper time being allowed to answer the questionnaire. Education Committee experience shows that a visit should cover at least 2 days, and in some cases more, in addition to the time required for the preliminary study of catalog and questionnaire material and for the preparation of the report.

As soon as possible after the visit each inspector prepares his report on the particular engineering curriculum and one or more supporting departments to which he is assigned, and submits his report to the chairman of the visiting committee. The chairman prepares a summary report including recommendations for action upon which he and his committee have agreed at a final conference at the institution, confirmed or modified by subsequent correspondence. This report goes to the general chairman of the Education Committee and is a confidential document available only to members of the Education Committee and the ECPD Council.

The Education Committee meets in June and again in September or October just prior to the annual meeting of the ECPD Council. At these meetings the regional chairmen and vice chairmen present summaries of all inspections made in their respective regions during the year. The committee considers at great length the results of institutional visits in arriving at its decisions. Each of these two meetings of the Committee on Education ordinarily consumes nearly 2 days, including some time devoted to questions of operation and policy. In some years a third meeting has been held in midwinter to consider policy matters.

At the annual meeting of ECPD in September or October the chairman of the Education Committee presents his report to a closed executive session of the council. The official council action is promptly transmitted to each institution concerned, together with a summary statement of the principal observations of the inspection committee. The annual report of ECPD, issued soon after the meeting, contains the up-to-date list of accredited curricula.

In reaching decisions on the acceptance or rejection of a curriculum for inclusion in the accredited list, ECPD carefully considers the quantitative in-

formation supplied by the institution covering budget, numbers of students and faculty, number of volumes in the library, salary scale, teaching loads, and other items. But experience has shown that the qualitative factors—the less concrete and tangible elements involved—have a significance beyond those capable of quantitative measurement. Basically the decision as to whether or not to accredit a curriculum rests on the combined judgment of the visiting committee, the Education Committee, and the ECPD Council successively exercised. The most important considerations in the judgment of all these groups are the quality of faculty, administration, and students.[2]

It has been said by many that ECPD should have a much more explicit measuring stick, that the judgment of a group of men is too vague and elusive a standard by which to appraise such a major activity as an engineering curriculum. However, the Education Committee, which has considered the subject seriously ever since the inauguration of the ECPD accreditation program, believes that the combined judgment of three groups of highly respected leaders of the profession, in which they consider qualitative and quantitative factors, can appraise the educational experience provided in an institution better than the most complex type of objective quantitative scoring could. Seldom is there any important disagreement among the members of a visiting committee or of the two reviewing groups as to whether or not a particular curriculum merits accreditation. The primary question in marginal cases is whether the overall educational opportunity is adequate to prepare the student to develop into a responsible, competent engineer.

Revisitation and Reevaluation

Accreditation, usually granted for a period of from 3 to 5 years, is based upon conditions at the time of inspection and is granted only when conditions are considered as currently meeting minimum overall requirements. If for any reason the future of the curriculum appears precarious or weaknesses exist which should be overcome, the accreditation may be granted for a shorter period of from 1 to 3 years. Such precarious conditions include uncertainty of financial status, uncertainty due to the nature of administrative organization, need for additions to staff or improvements in staff or equipment, a new or changing curriculum, and undue dependence upon a single individual.

The annual reports of ECPD show only accreditation and give no indication of the term of accreditation of any curriculum. As far as the public is concerned all curricula listed in the reports have equal standing, but the institution in which a curriculum has been accredited for a limited period knows of the time limitation and the reasons for it, and that a reinspection is to be expected after the stated term.

Ordinarily no reports are expected or required from institutions between inspections. Sometimes, however, short-term accreditation (1 to 3 years) is based on conditions which at a later date can be checked by a letter report, as for example the continued presence on the faculty of an individual on whom a curriculum is critically dependent. In such cases a letter may enable the Education Committee to recommend continued accreditation for one or more years up to the 5-year limit, without reinspection.

Accreditation of Technical Institute Programs

In 1944, in an effort to serve industry and the engineering profession by stimulating the development of a better balanced system of technical education, ECPD appointed a subcommittee on Technical Institutes within its Committee on Engineering Schools (now the Education Committee). The subcommittee considers programs in the broad area of technical post-high-school education which lies between professional engineering and vocational education. Such programs may be offered by schools in the following categories: (1) Technical institutes, endowed or publicly supported; (2) junior colleges offering terminal programs; (3) evening and extension divisions of colleges and universities; (4) proprietary schools; (5) schools or training divisions associated with industries; and (6) specialized schools offered by divisions of government.

The first list of accredited technical institute programs was published in the ECPD annual report of September 30, 1946, and listed 7 programs in 3 institutions. The list has grown longer each year, and in 1954 was published as a separate report, containing 84 programs in 27 institutions.

The general principles and procedures for the

[2] For an excellent discussion of the things which ECPD inspection teams look for in appraising curricula, with respect to faculty, administrative organization, constitution of curriculum, and other pertinent considerations, the reader is referred to the first article by Dean Hazen listed in the Selected References at the end of this article.

accrediting of technical institute programs are similar to those described for degree programs, with due allowance for the different objectives.

Costs of Accreditation

The expenses of operating the accrediting program of ECPD are borne in part by the institutions inspected and in part by grants from the participating societies. Direct expenses of the visiting committees representing the council are approximately covered by an inspection fee paid by the individual institution. By action of the ECPD executive committee on October 28, 1953, the following fees, which are the same for inspections or reinspections, were established: for inspection of a single curriculum, $150; for inspection of 2 or more curricula at the same time, $100 each. Certain changes in these fees are being considered by ECPD as this article is written. If adopted, they may in some cases increase the cost to an institution.

The 1954 annual report of ECPD contains a financial statement which indicates that inspection fees from engineering schools and technical institutes during the year ending September 30, 1954, were slightly more than sufficient to pay the direct costs of inspections, but not enough to cover the central office overhead costs of the operation. The income of ECPD, aside from these inspection fees, comes from grants from participating societies, sales of publications, and special gifts, and from this income must come most of the overhead costs of the accrediting operation. The accreditation program is only one of several activities of ECPD, and the report does not indicate what portion of the central office cost (about 31 percent of total expenses) should be charged to it. It is certain, however, that the participating societies are partially underwriting the cost of the accreditation program.

Relations With Regional Accrediting Agencies

The National Commission on Accrediting [3] has evolved a general policy which conceives of the regional accrediting associations as coordinating agencies under which cooperative and collaborative operation with professional accrediting agencies may be developed.

The Middle States Association of Colleges and Secondary Schools (MSA), which has a well developed accreditation program, has proceeded on this basis by entering into agreements with certain professional accrediting agencies for cooperative inspections, of which the first was made with ECPD. During the winter of 1952–53, representatives of MSA and ECPD held several exploratory sessions which led to the design of a combined questionnaire and to an experimental cooperative inspection.

The questionnaire sent to the institution consists of part A, which calls for data of common interest to ECPD and MSA and is answered once for the entire institution, and part B, which has been worked out jointly with ECPD and deals with items concerning the engineering school only. Similar parts B are available to other professional accrediting agencies with which MSA is cooperating.

MSA approves or disapproves an institution as a whole. It renders to the institution a comprehensive report on its observations of the institution's operations. This includes sections specially prepared by ECPD, in accord with MSA objectives, on the engineering school as a whole, including any graduate or nondegree work offered. The ECPD reports, on the other hand, apply only to the engineering curricula submitted for accreditation and are confidential with the inspection committee, the Education Committee, and the council of ECPD. The institution receives an official notification of ECPD action on curricula submitted for inspection, in addition to the general statement of observations contained in the MSA report.

MSA and ECPD have made several joint inspections which both organizations have considered successful. The ECPD members of the visiting team do essentially the same job they would do if visiting the institution alone, with respect to the major engineering departments for which accreditation has been requested. They also function as members in full standing of the MSA team, with full responsibility for the MSA appraisal of the engineering departments. The MSA visitors in turn, either alone or jointly with ECPD men, supply an appraisal to ECPD of such fields as the humanities and social sciences, the basic sciences, administration, library, admissions, and other areas supporting the engineering activities.

From the point of view of ECPD this collaboration gives a more thorough and more expert appraisal of the nonengineering aspects of the institution than ECPD alone would obtain. The ECPD team can

[3] Composed of representatives of 7 national educational agencies, and created in 1946 in an effort to eliminate certain objectionable practices, arbitrary and unreasonable criteria, threats of unhealthy restraint upon educational experimentation, and unnecessary duplication of work which had resulted from the activities of the large number of accrediting agencies then active.

therefore concentrate more attention on those areas in which it is expert.

The chairman of the MSA Commission on Institutions of Higher Education has cited as benefits deriving from the cooperative arrangement, ". . . a better knowledge and understanding of the institution as a whole by all concerned; a reduction in duplicative activities and overlapping costs; a lessening to some degree in the movement toward entrenched departmentalism; and an appraisal of the institution and its various parts made available to it in the final report developed on a joint basis."

The Education Committee of ECPD is moving toward similar working agreements with other regional accrediting agencies. Such cooperative procedures will, of course, have to be worked out carefully over a period of years. Many problems will arise because the various regional associations differ in policies, organization, procedures, and finance, and the geographic regions overlap in some instances and in general do not coincide with ECPD's regions. However, both MSA and ECPD believe that the program of cooperation can be worked out to the satisfaction of both groups and the educational institutions they serve.

Problems in Accrediting Engineering Curricula

By way of summary, it may be helpful to list some of the major problems involved in the accreditation of engineering curricula, most of which have been at least suggested in the preceding paragraphs.

The basic underlying problem, from which all the others stem, is to develop and operate a program of accreditation which will realize the two primary objectives of ECPD while avoiding the hazards involved. The two basic objectives are to identify curricula which meet at least minimum standards of acceptability and prepare students for useful and successful careers as engineers, and to assist the engineering schools in strengthening their programs above the minimum acceptable level through the suggestions of experts, who, because they have no obligation to the institution, can offer a detachment and a perspective which are often helpful to the institution. The hazards involved are those of imposing undue standardization, of discouraging experimentation, and of interfering with the responsibilities of an institution toward its board of trustees and the public, and with its ideals as an independent agency. The Education Committee of ECPD has from its beginning been aware of these hazards and has consistently and sincerely endeavored to avoid them.

The basic problem might be described as one of establishing standards without producing rigid uniformity. Engineering education involves many and varied elements, some of the most important of which are intangible and can be evaluated only by the exercise of discriminative judgments by experts. These elements vary so greatly from institution to institution that flexibility is essential if undesirable restraint is to be avoided and educational experimentation encouraged.

ECPD has from its beginning deliberately avoided the establishment of specific quantitative values for the criteria which it has set forth for judging engineering curricula. The new criteria now under consideration are semiquantitative, but still indicate only approximate time requirements in rather broadly stated fields. They indicate the acceptance in principle by ECPD of the recommendations of the ASEE Committee on Evaluation of Engineering Education, which attempted to outline the kind of scientifically oriented curricula needed to prepare engineering students of today to become leaders of the profession 25 years hence. They still leave a considerable amount of opportunity for institutions to conduct educational experimentation, which is urged repeatedly in the report of the ASEE Committee, and is emphasized by ECPD.

The most important elements in judging the effectiveness of an engineering curriculum are its composition, level, and relative emphasis on general education, basic science, engineering science, and engineering application; the standards of performance required of students; the physical facilities of the institution; and most important of all, the character and quality of the faculty and the nature of the administrative support given the faculty. On all these elements quantitative data are necessary and valuable, but the more important aspects depend upon the objectives of the institution, its environment and individuality, and upon many other intangible elements which cannot be appraised quantitatively.

A practical problem which faces ECPD, especially when its appraisal of a curriculum is not favorable, is the problem of relations with the educational institution. No president or dean is pleased with serious criticism of his institution or his curriculum. On the other hand, any administrator should welcome constructive suggestions. To strike the proper balance involves rather delicate problems in human

relations, but with good will on both sides the ultimate result has nearly always been constructive and rewarding.

As is the case with any human organization charged with delicate and exacting tasks, one of the most difficult aspects of the ECPD program is that of securing properly qualified personnel for the inspection committees. Members of these committees should be thoroughly familiar with educational operations, should understand the requirements of industry and government for professional engineering services, and should have an appreciation of the trends in both general and engineering education and a knowledge of what kind of training is needed to prepare present students for future engineering practice. They should be able to determine by interview and observation the strengths and weaknesses of an engineering school, which requires a considerable degree of wisdom in evaluating the many different elements which contribute to the total educational experience of the student.

The inspection committees are of necessity drawn largely from the engineering teaching profession, but ECPD is constantly on the alert to find practicing engineers with the necessary qualifications and the time to take part in the important work of inspecting engineering curricula. These men are able to bring to an inspection committee the practical viewpoints of industry or government, which must be borne in mind in determining the effectiveness of an institution in preparing future engineers, the basic reason for the ECPD program of accreditation of engineering curricula.

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Federal Service Entrance Examination

IN A DRIVE to attract able young people and to meet the stiff competition with private industry for college-caliber or college-trained recruits, the Civil Service Commission will hold a "Federal service entrance examination." Under its new manpower planning and career recruitment procedure, college recruiting can be done with a single examination to serve both Washington, D. C., and the field. This examination will replace about 30 entrance examinations but not current examinations in the physical sciences, engineering, and certain other technical fields such as accounting. By this unified approach it is hoped that more candidates of college caliber will be available for careers in the Federal service.

The examination is to be open continuously starting with its announcement on October 18. Those filing applications by November 18 will take the first written examination on December 10. The first register of eligibles will be established on February 9, 1956. The Civil Service Commission and the Federal agencies are making plans now for letting students know of assignments in the Federal Government which will be available to eligibles from this examination.

The Department of Health, Education, and Welfare hopes to attract many college students through its programs which are well known since they, in one way or another, touch almost every home in the country. The Department's programs are administered through the following constituent units: Office of Education; Office of Vocational Rehabilitation; Food and Drug Administration; the Public Health Service; and the Social Security Administration.

Students trained in administrative management, statistics, journalism and the social sciences will find opportunities in most of these organizations. In addition, careers are open to students having at least 24 semester hours in accounting as examiners with the Bureau of Federal Credit Unions, Social Security Administration; and to students majoring in the biological sciences as inspectors for the Food and Drug Administration. Both of these positions require exercise of independent judgment and offer opportunities for contact with the public. For example, the Federal Credit Union examiner while supervising and examining credit unions may meet with heads of large corporations, churches, and civic organizations. The Food and Drug inspector may find satisfaction in the part he plays in getting a ship-

ment of contaminated food or a dangerous drug off the market.

The Social Security Administration is best known for the program administered by the Bureau of Old-Age and Survivors Insurance, which provides social security benefit payments to millions of people. For more than 530 district offices it recruits college graduates to trainee jobs leading to positions of claims representatives. These employees meet and deal with the public. Career promotional possibilities include the positions of field representative, claims supervisor, disctrict manager, and numerous technical and administrative opportunities in the area and headquarters offices.

The Public Health Service is the principal agent of the Federal Government concerned with the Nation's health and health services. The programs require large numbers of persons in the medical, engineering, and scientific professions, and offer excellent opportunities to persons trained in administrative management, statistics, journalism, social sciences, and biological sciences.

While this examination does not replace current examinations in all fields, students from practically any field may enter the Federal service through this "umbrella" examination. Applicants for the examination will be given the opportunity to state whether they are available only in their field of specialization or to certain departments or agencies. A student interested in a particular unit of the Department of Health, Education, and Welfare should write to that unit to make his interest known and to learn whether his services can be used. The unit can then request his certification under an "earmarking" provision.

UNESCO Newsletter

THE U. S. NATIONAL COMMISSION for UNESCO is issuing a biweekly *Newsletter* reporting on current activities of the United Nations Educational, Scientific and Cultural Organization and United States participation in its work. In four pages the *Newsletter* gives brief news notes on international and national activities in UNESCO's fields of education, science, and culture. It contains reports on international meetings, new publications of UNESCO, and developments in the United States. Persons interested in receiving the *Newsletter* may request it from the U. S. National Commission for UNESCO, Department of State, Washington 25, D. C.

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